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(21) International Application Number: PCT/IB00/00189 (22) International Filing Date: 22 February 2000 (22.02.00) (30) Priority Data: 99/00214 25 February 1999 (25.02.99) RO (71)(72) Applicant and Inventor: SILAGHI, Marius, Calin [RO/RO]; Vlad Tepes 7/30, R-4800 Baia Mare (RO).		(81) Designated States: <u>US</u> European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: SPEECH RECOGNITION AND SIGNAL ANALYSIS BY STRAIGHT SEARCH OF SUBSEQUENCES WITH MAXIMAL CONFIDENCE MEASURE (57) Abstract The invention belongs to the technical domain of decoding, classification, alignment and matching of data. The invention refers to new methods of keyword spotting in utterances, detection of subsequences in chains of organic matter (DNA) and recognition of objects in images. The proposed methods search in an optimized way the matching that maximizes, over all the possible matchings, certain confidence measures based on normalized posteriors. Three such confidence measures are used, two are inspired from anterior work in Speech Recognition, and the third one is a new one. Application fields for this invention are: man-machine interfaces (using speech recognition; ex: control systems, banking, flight services, etc.), coordination systems (for industrial robots and automata) and development systems for pharmaceutical products.		

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 00/00189

CLASSIFICATION OF SUBJECT MATTER

IPC⁷: G10L 15/18, 15/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: G10L 15/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5638489 A (TSUBOKA) 10 June 1997 (10.06.97) abstract; claims 1-6; column 4; line 42 - column 5, line 62.	1-4
A	US 5764851 A (PENGWU) 9 June 1998 (09.06.98) abstract; fig.1; claims -15; column 1, line 42 - column 4, line 31.	1-4
A	US 5535305 A (ACERO et al.) 9 July 1996 (09.07.96) abstract; claims 1; column 3, line 37 - line 60. ----	1-4

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

2 May 2000 (02.05.2000)

Date of mailing of the international search report

28 July 2000 (28.07.2000)

Name and mailing address of the ISA/AT

Austrian Patent Office
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB 00/00189

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

A.) Claims 1,2: speech recognition
B.) Claim 3: biomolecular subsequences
C.) Claim 4: position of objects in images
therefore the search report is restricted to claims 1 and 2.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB 00/00189

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
US	A	5638489	10-06-1997	JP	A2	5333898	17-12-1993
				JP	B2	2795058	10-09-1998
				US	A	5608840	04-03-1997
				US	A	5608841	04-03-1997
US	A	5764851	09-06-1998	none			
US	A	5535305	09-07-1996	none			